DISTRICT OF COLUMBIA
PUBLIC SCHOOLS
Office of the Chief Academic Officer

Summer 2010

# Science Summer Learning Packet

## Grades 3-5

1200 First Street, NE | Washington, DC 20002 | T 202.442.5599 | F 202.442.5081 | www.dcps.dc.gov

## Introduction

The activities in this packet have been adopted from Miami-Dade County Public Schools and are aligned to DC Standards. These activities were selected to allow our students to experience science in a fun and engaging way. As you work with your child to complete these activities this summer, you will realize that science is not limited to only the classroom. In fact, science is in our everyday lives. Science can be done away from school and can explain many of the natural phenomena that occur around us.

# Grade 3

## Bird's Eye View

**Background**

There are about 8,500 different kinds of birds. Birds are similar to mammals, which are creatures like you and me. Of course, there are quite a few differences between birds and regular mammals. A bird has feathers and wings. They use their wings to fly. However, some birds such as the ostrich or the penguin do not fly because their bodies are not designed to fly. Under all of the feathers and inside the wing, the bird has muscles. The muscles inside the wing are attached to the breastbone of the bird and are known as flight muscles.

These are like the muscles that you have in your arms. Thanks to these muscles birds can flap their wings and fly if they are able. Along with their wings, which are a replacement of arms or front legs for other animals, birds also have two legs. If you have ever seen a bird sitting on a tree branch you have seen them using their legs. They are able to perch themselves on branches or hop from limb to limb by using their legs. *(Adapted from All About Birds)*

**What You Need**

- Science Journal or Notebook
- Walking Buddy

**What to Do**

Go for a walk around your neighborhood and try to identify four types of birds. Draw a picture of each of the birds you identify. Lastly, write down (or draw) the characteristics of each of the birds that you chose. You can record your observations on the following page or make a copy of the chart below in your journal.

| | Bird | Color(s) | Shape of beak | Size | Location |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |

## Icky Sticky Stuff

*Adhesives are used to stick things together. Many adhesives occur in nature and have important uses for plants and animals*

**Background**

What makes glue, paste or tape stick to things? Wood, paper and many other materials have tiny cracks and holes in them. When we glue things together, sometimes the glue seeps into the tiny openings and hardens, making the materials stick together. Other times, the molecules on the surface of an object get tangled up with the glue molecules, making the objects stick together.

**What You Need**

A walking buddy

**What to Do**

Help your child to search around your home to track down things that they can see that are sticky. See how many things they can find. The following examples can be found:

- Tape
- Peanut butter
- Stamps
- Envelopes
- Honey
- Bandage

Ask your child to make a list of things in nature – animals, plants and so forth – that are sticky (have adhesive properties). For example:

- Spiders have sticky threads.
- Tree sap is a sticky substance.

**Complete the data table below.**

| Object | What does it look like? | What does it feel like? |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

# Grade 4

## Bubble Gum Science

*Discover what brand of bubble gum can be used to blow the biggest bubble.*

**Background**

Times have changed. At one time, chewing gum in school got you into big trouble. Not only did you have to spit it out but you had to write, "I will not chew gum in school" a hundred times! Today, kids are learning how to make gum in science class as a lesson in the chemistry of food.

**What You Need**

- Two brands of Bubble Gum
- Measuring distance tool (i.e., string, ruler)

**What to Do**

Have your child predict which brand of gum will make the biggest bubble. He or she is to then chew one piece of gum at a time and blow a bubble with each piece. Once the bubble is blown to as large as possible, measure its width and record on the data chart on the next page. After chewing both brands of bubble gum and measuring the width of each bubble, have your child repeat the procedures two more times for a fair test and record this data. Then he or she finds the average for each of the three trials. Ask your child to compare the data collected to his or her prediction to see if it was correct.

1. Predict which brand of gum you think will make the biggest bubble. Why do you think this?

| Width of Bubble in Centimeters (cm) | | | | |
|---|---|---|---|---|
| **Brand** | **Trial 1** | **Trial 2** | **Trial 3** | **Average** |
| | | | | |
| | | | | |

2. Which brand of gum on average made the biggest bubble?

3. Was your prediction correct? Why?

4. What new question has your experiment lead you to ask that could be tested in another investigation?

**Global Warming: What It Is…**

**(From the United States Environmental Protection Agency)**
*http://epa.gov/climatechange/kids/gw.html*

Read the information below from the EPA. Then write the answers to the five questions in the table below the sample table.

**Greenhouse Effect, Climate Change, and Global Warming**

Earth has warmed by about 1ºF over the past 100 years. But why? And how? Well, scientists are not exactly sure. The Earth could be getting warmer on its own, but many of the world's leading climate scientists think that things people do are helping to make the Earth warmer.

**The Greenhouse Effect:** Scientists are sure about the greenhouse effect. They know that greenhouse gases make the Earth warmer by trapping energy in the atmosphere.

**Climate Change:** Climate is the long-term average of a region's weather events lumped together. For example, it's possible that a winter day in Buffalo, New York, could be sunny and mild, but the average weather – the climate – tells us that Buffalo's winters will mainly be cold and include snow and rain. Climate change represents a change in these long-term weather patterns. They can become warmer or colder. Annual amounts of rainfall or snowfall can increase or decrease.

**Global Warming:** Global warming refers to an average increase in the Earth's temperature, which in turn causes changes in climate. A warmer Earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans. When scientists talk about the issue of climate change, their concern is about global warming caused by human activities.

| | |
|---|---|
| Who? | The person or thing the story is about |
| What? | The event taking place |
| When? | The time the action has or will happen |
| Where? | The place where the action happens |
| Why? | The reason the action has or will happen |

Fill out your answers based on the reading above in the space provided.

| | |
|---|---|
| Who? | |
| What? | |
| When? | |
| Where? | |
| Why? | |

# Grade 5

## A Penny for Your Thoughts

**(This activity has been adapted from Scott Foresman Science)**

**Background**

What happens to wood when it burns? It gives off heat, of course. But that is not all; it also goes through a chemical change. The wood combines with oxygen and changes to new substances. Some of the wood turns into gases that goes into the atmosphere. Much of the wood is changed to ashes. When you put out a campfire, you are looking at another chemical change.

In a chemical change, one kind of matter changes into a different kind of matter. A chemical change happens when bread is baked. "The batter is a mixture of ingredients. But the heat of the oven causes chemical changes to happen. Then a new substance, bread, is formed. It is a chemical change because you cannot get the original ingredients back because a new substance is formed. For example, you cannot turn bread back into wheat and water.

After water freezes into ice, the ice can melt back to water. Each change is a physical change. Unlike a physical change, materials that have gone through a chemical change usually cannot be changed back to the original kind of matter. Compare a cracked open raw egg in a bowl to a fried egg in a pan. Do you think any physical changes take place when you **cook** an egg?

Answer:
There are changes in color from clear albumen to white, and a change in shape from a liquid that takes the shape of its container to a solid with a definite shape.

**Dirty Penny**

**Materials**

- safety goggles
- dirty, tarnished pennies
- metric measuring cup
- plastic container
- fresh white vinegar
- water
- plastic spoon

**Procedure**

1. Measure 100 ml. of vinegar and pour it into the container.
2. Measure 25 ml. of water. Pour it into the same container and stir with a spoon.
3. Describe the penny. Draw a picture and color the picture. Make sure that you color the penny the same as it appears.
4. Drop the penny into the vinegar and water solution.
5. Observe the penny after it soaks for 5-10 minutes.
6. Keep the penny in the solution overnight. Compare your results.

7. Describe the penny after 5-10 minutes in the solution.
8. Describe the penny after leaving it in the solution overnight.
9. What changes did you observe in the penny?
10. Is this a chemical change or a physical change? Explain your answer.

## Chemical Changes

**Background**

We use chemical changes every day, from eating pizza to watching a fireworks display. Chemical changes in batteries release electricity that appliances use to function. In 1800, Count Alessandro Volta invented the one cell battery. Commercial applications of the battery did not become practical until the development of the alkaline batteries around 1900. These are the batteries we still use today. Since the invention of the battery in 1800, its uses have changed dramatically.

**What to Do**

Research some of the ways that batteries have changed and how it has affected our lives. Prepare your findings using a timeline, diagram, or display.